

THE NORTHERN CANADA POWER COMMISSION'S POSITION:

ENERGY NEEDS OF YUKON

The Northern Canada Power Commission's Position:

Energy Needs of Yukon

Government of the Yukon

NORTHERN ENERGY COMMISSION HAS BEEN ACTIVELY INTERESTED WITH ATTENTION
TO YUKON'S ENERGY NEEDS AND HAS BEEN STUDYING THEM. CONSEQUENTLY, NOT
VERY MUCH NEW CAN BE ADDED TO THE SUBJECT - SUFFICE TO SAY, THESE DIS-
CUSSIONS DWELL ON THE PROBLEMS OF DEVELOPING RENEWABLE OR NON-RENEWABLE
RESOURCES LOCATED IN THE NORTH. THE DEVELOPMENT OF WHICH COULD LESSEN OUR
NEEDS FOR IMPORTED ENERGY AND UNDER SOME CIRCUMSTANCES, PROVIDE A SURPLUS
FOR EXPORT. ENTHUSIASTIC AS THE PROPOSERS OF THESE IDEAS WERE, AND CON-
TINUE TO BE, I DO NOT THINK WE CAN HAVE NOT SEEN ANY OF THESE IDEAS MATERIALIZE.
ONLY A PORTION OF YUKON'S ENERGY NEED IS SUPPLIED BY OUR OWN RESOURCES -
THE BALANCE CONTINUES TO BE IMPORTED.

NOW, LET'S REVISIT THE PRESENT ENERGY PICTURE. YUKON'S EXISTING SYSTEM
REPRESENTS ABOUT A RECAPITULATION OF CAPACITY WITH POTENTIAL PRODUCTION AND
CONSUMPTION REASONABLY BALANCED.

ON THE PRODUCTION SIDE, ABOUT ONE OF ELECTRICITY PRODUCED TERRITORY-WIDE
COMES FROM HYDRO AND THE BALANCE FROM DIESEL GENERATORS. IN THE INTER-
CONNECTED WESTERN CANADA-ALBERTA GRID SYSTEM, WHICH ACCOUNTS FOR ABOUT
THREE-FOURTHS OF THE POWER IN YUKON, THERE IS A VARIATION IN PRODUCTION - NOT
STAYING IN THE NORTH.

ON THE CONSUMPTION SIDE, ABOUT ONE OF THE ENERGY GOES TO HEAT
IMPORTED - NARROW THE MARKET, AND IS USED FOR INDUSTRIAL PURPOSES, AND
THE REMAINING, FOR STREET LIGHTING AND COMMERCIAL BUILDINGS.

THE SIGNIFICANCE OF THESE FIGURES IS NOT APPARENT UNTIL THE SITUATION IS
VIEWED IN THE CONTEXT OF LOCAL AND WIDE-SPREAD INFLATIONARY TRENDS. FOR

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"THE NORTHERN CANADA POWER COMMISSION'S POSITION:

ENERGY NEEDS OF YUKON"

NORTHERN RESOURCE CONFERENCES HAVE TRADITIONALLY DEVOTED MUCH ATTENTION TO YUKON'S ENERGY NEEDS AND WAYS OF SATISFYING THEM. CONSEQUENTLY, NOT VERY MUCH NEW CAN BE ADDED TO THE SUBJECT - SUFFICE TO SAY, THESE DISCUSSIONS DWELT ON THE POTENTIAL OF EITHER RENEWABLE OR NON-RENEWABLE RESOURCES LOCATED IN THE NORTH, THE DEVELOPMENT OF WHICH COULD LESSEN OUR NEEDS FOR IMPORTED ENERGY AND UNDER SOME CIRCUMSTANCES, PROVIDE A SURPLUS FOR EXPORT. ENTHUSIASTIC AS THE PROPONENTS OF THESE IDEAS WERE, AND CONTINUE TO BE, NORTHERNERS SO FAR HAVE NOT SEEN ANY OF THESE IDEAS MATERIALIZE. ONLY A PORTION OF YUKON'S ENERGY NEED IS SUPPLIED BY OUR OWN RESOURCES - THE BALANCE CONTINUES TO BE IMPORTED.

NOW, LET'S EXAMINE THE PRESENT ENERGY PICTURE. NCPC'S EXISTING SYSTEM REPRESENTS ABOUT 80 MEGAWATTS OF CAPACITY WITH POTENTIAL PRODUCTION AND CONSUMPTION REASONABLY BALANCED.

ON THE PRODUCTION SIDE, ABOUT 70% OF ELECTRICITY PRODUCED TERRITORY-WIDE COMES FROM HYDRO AND THE BALANCE FROM DIESEL GENERATORS. IN THE INTER-CONNECTED WHITEHORSE-FARO-AISHIHIK GRID SYSTEM, WHICH ACCOUNTS FOR ABOUT THREE-QUARTERS OF THE POWER IN YUKON, THERE IS A SIMILAR PROPORTION - 70% HYDRO TO 30% DIESEL.

ON THE CONSUMPTION SIDE, ABOUT 60% OF ELECTRICAL ENERGY GOES TO HEAVY INDUSTRY - MAINLY THE MINES, 20% IS USED FOR RESIDENTIAL PURPOSES, AND THE REMAINDER, FOR STREET LIGHTING AND COMMERCIAL BUILDINGS.

THE SIGNIFICANCE OF THESE FIGURES IS NOT APPARENT UNTIL THE SITUATION IS VIEWED IN THE CONTEXT OF LOCAL AND WIDESPREAD INFLATIONARY TRENDS. THE

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30% OF THE POWER WE ARE PRODUCING BY DIESEL GENERATION MEANS THAT WE ARE IMPORTING INFLATION THROUGH THE RISING COSTS OF FUEL. THESE COSTS ARE AFFECTING THE BUYING POWER OF RESIDENTS AND THE DECISION-MAKING PROCESS OF THOSE CONSIDERING INDUSTRIAL PROJECTS IN YUKON.

IN THE WHITEHORSE-FARO SYSTEM WHERE THE BASE LOAD IS SUPPLIED BY HYDRO AND DIESEL IS ONLY A SUPPLEMENT, POWER COSTS HAVE BEEN RELATIVELY IMMUNE TO THE STEADY INCREASE IN FUEL COSTS, BUT NOT SO IN COMMUNITIES BEYOND THE SCOPE OF THAT GRID WHERE ELECTRICITY COSTS ARE DIRECTLY RELATED TO THE PRICE OF DIESEL FUEL. AS A RESULT, GOVERNMENTS HAVE INSTITUTED SUBSIDY AND EQUALIZATION PROGRAMS TO BRING SOME ELEMENT OF RELIEF, BUT THESE CAN ONLY BE VIEWED AS TEMPORARY MEASURES UNTIL A BETTER SOLUTION CAN BE FOUND.

A LOOK AT HOW MUCH THE CAPACITY-DEMAND BALANCE COULD CHANGE OVER THE NEXT FEW YEARS REVEALS MORE THAN THE USUAL AMOUNT OF UNKNOWNNS. WITH A NOMINAL GROWTH FACTOR OF, SAY, 5% PER YEAR, RESIDENTIAL DEMAND COULD INCREASE BY OVER 50% WITHIN TEN YEARS. WITH A GROWTH STIMULUS, DEMAND COULD ESCALATE EVEN FASTER. IF THE PRICE OF ELECTRICITY RELATIVE TO OTHER ENERGY COSTS WAS ATTRACTIVE TO CONSUMERS, THEN THERE MIGHT BE AN EVEN GREATER DEMAND AS USERS SUBSTITUTED ELECTRICITY FOR OTHER ENERGY FORMS.

INDUSTRIAL DEMAND COULD OUTSTRIP THE RESIDENTIAL GROWTH FACTOR SUBSTANTIALLY. THE MINING INDUSTRY CONTINUALLY EMPHASIZES THAT IF THE CONDITIONS WERE RIGHT, VARIOUS PROJECTS COULD BE USING FROM 55 TO 80 MEGAWATTS BY THE EARLY 1980'S. THE ALASKA HIGHWAY PIPELINE COULD USE 160 MEGAWATTS BY THE MID-EIGHTIES.

THESE THREE USES ALONE COULD ADD DRAMATICALLY TO THE DEMAND ON THE INTER-

CONNECTED SYSTEM BY THE LATE 1980'S. AFTER THAT, IT WOULD BE DIFFICULT TO HAZARD A GUESS, ALTHOUGH SOME STUDIES SHOW DEMAND REACHING THE 350 TO 500 MEGAWATT RANGE. THE MAGNITUDE OF THESE UNKNOWNNS INDICATES THAT, IF ANY MAJOR INCREASE OCCURS, ADDING A FEW MORE DIESEL GENERATING UNITS TO THE SYSTEM IS UNLIKELY TO PROVIDE A LONG-TERM SATISFACTORY ANSWER.

IN THE FACE OF THESE POTENTIAL VARIABLES, FUTURE PLANNING MUST BE ABLE TO ACCOMMODATE AT LEAST THREE POSSIBLE SCENARIOS:

1. NORMAL GROWTH, NEAR TERM (2 - 4 YRS) - AND IT HAS BEEN SHOWN THIS CAN BE ACCOMMODATED WITH ADDITIONS TO PRESENT PLANT FOR WHICH PLANNING IS IN HAND. (E.G. 4TH TURBINE AT WHITEHORSE RAPIDS PLANT). THE NORMAL RATE OF GROWTH OF THE POPULATION AND INDUSTRY IN YUKON CAN BE ACCOMMODATED AND THE COSTS CAN BE EXPECTED TO BE REASONABLE, AND BE BORN BY TODAY'S CUSTOMER.
2. ACCELERATED GROWTH, MID-TERM (5 - 10 YRS) - STIMULATED BY PIPELINE CONSTRUCTION. ALTHOUGH INITIAL FORECASTS AND PLANNING HAVE BEEN DONE, NO FEASIBILITY STUDIES HAVE TAKEN PLACE.
3. LONG TERM GROWTH (BEYOND 10 YRS) - TO ACCOMMODATE INDUSTRY AND DOMESTIC NEEDS AND PROVIDE AN 'ON-SHELF' INVENTORY OF ELECTRIC ENERGY.

THE OPPORTUNITY TO STIMULATE ECONOMIC GROWTH IN YUKON BY THE DEVELOPMENT OF THE RENEWABLE HYDRO RESOURCE IS VERY REAL; NOT ONLY COULD THIS DEVELOPMENT BE USED TO PROVIDE A DEPENDABLE, STABLE-COST SOURCE OF CLEAN NON-POLLUTING ENERGY WITHIN THE REGIONS, BUT THE EXCESS BEYOND LOCAL NEEDS COULD BE EXPORTED TO SOUTHERN CANADA BY CONNECTIONS TO THE ADJOINING PROVINCIAL TRANSMISSION GRIDS; PROVIDING MUCH NEEDED INCOME TO THE NORTH AND ALSO, CONSERVING NON-RENEWABLE RESOURCES IN THE SOUTH. CONVERSELY, THE GRID CONNECTION WOULD OFFER A NEEDED ELEMENT OF RELIABILITY TO THE TERRITORIES'

SYSTEM AND PERMIT IMPORT OF ENERGY IN TIMES OF LOCAL SHORTAGE (E.G. A LOW WATER CYCLE). RELIABILITY OF ELECTRICAL SUPPLY IS NECESSARY FOR INCREASED DOMESTIC DEMAND AND IS CRUCIAL FOR SOME INDUSTRIAL USES.

THE SOLUTIONS TO THE LONG TERM GROWTH NEEDS CAN BE FOUND THROUGH APPROPRIATE PLANNING AND DESIGN FOR MEETING SPECIFIC NEEDS OF THE MID-TERM GROWTH, PARTICULARLY THOSE RESULTING FROM THE ALASKA HIGHWAY GAS PIPELINE PROJECT AND MINERAL-RELATED INDUSTRIAL DEVELOPMENT.

ATTAINMENT IN FULL OF THE FOREGOING SUGGESTS AN INVESTMENT OF OVER ONE BILLION DOLLARS WITHIN THE NEXT TEN YEARS FOR ELECTRIC ENERGY DEVELOPMENT AND TRANSMISSION LINES IN YUKON. THE ANNUAL REVENUE REQUIRED TO MEET THE DEBT CHARGES, OPERATIONAL AND OTHER EXPENSES WILL BE WELL IN EXCESS OF ONE HUNDRED MILLION DOLLARS IN THE INITIAL YEARS, OR MORE THAN TEN TIMES THE CURRENT ANNUAL INCOME OF THE WHITEHORSE SYSTEM.

WHILE THE POTENTIAL REQUIREMENT FOR THIS MAGNITUDE OF POWER APPEARS TO BE REALISTIC AND IT IS CERTAIN SOME, IF NOT ALL, WILL MATERIALIZE, NOT A SINGLE COMMITMENT HAS BEEN MADE BY THE POTENTIAL USERS OF THIS POWER.

THE MAXIMUM DEMAND ON THE WHITEHORSE/AISHIHIK SYSTEM THIS WINTER IS EXPECTED TO BE IN THE NEIGHBOURHOOD OF 58 MEGAWATTS AND THE ENERGY REQUIREMENT IS EXPECTED TO BE ABOUT 330 MILLION KILOWATT HOURS. THIS WILL MEAN ABOUT 8 TO 10 MEGAWATTS OF DIESEL PEAKING DURING THE WINTER MONTHS AND, DUE TO THE LOW WATER SITUATION ON AISHIHIK LAKE, WE EXPECT TO GENERATE ABOUT 25 MILLION KILOWATT HOURS OF DIESEL-ELECTRIC ENERGY THIS YEAR. IT CAN THUS BE SEEN THAT IF ALL OF THE POTENTIAL REQUIREMENT MATERIALIZES, WE ARE MULTIPLYING PRESENT REQUIREMENTS BY A FACTOR APPROACHING TWENTY. THE BRIGHT PART OF THIS PROSPECT IS THAT THE TWENTY TIMES AMOUNT OF POWER IS ONLY TEN TIMES THE PRESENT COST - VIRTUALLY ONE HALF - DUE TO ECONOMIES OF SCALE.

WHETHER THESE DEVELOPMENTS WILL EVER MATERIALIZE WILL NOT BE DECISIONS OF THE NORTHERN CANADA POWER COMMISSION. ESTABLISHING PRIORITIES THAT WILL ULTIMATELY DECIDE WHETHER THESE DEVELOPMENTS OCCUR RESTS WITH THE GOVERNMENTS OF THIS COUNTRY. OBVIOUSLY, THE VARIED INTERESTS THAT EXIST IN OUR SOCIETY TODAY WILL INFLUENCE THOSE DECISIONS.

OUR JOB IS TO HAVE PLANNING IN HAND TO ACCOMMODATE WHATEVER EVENTUALITIES THE FUTURE HOLDS - AND IT IS TO THIS END OUR EFFORTS ARE BEING DIRECTED. THEREFORE, TO SUM UP -----

1. THERE ARE POTENTIAL ENERGY SOURCES IN THE TERRITORY WHICH CAN REALISTICALLY PROVIDE POWER TO ENHANCE NORTHERN RESOURCE DEVELOPMENT.
2. ALL ACTIONS TO DEVELOP THE ENERGY SOURCES, BOTH LONG AND SHORT TERM, IN YUKON, MUST BE DONE IN THE CONTEXT OF ENVIRONMENTAL CONCERNS, NATIVE LAND CLAIMS AND FINANCIAL CONSIDERATIONS.
3. NEITHER THE MINING COMMUNITY, THE PIPELINE PROPONENT, NOR THE SMELTER INTEREST HAVE MADE ANY COMMITMENTS WHICH WOULD ALLOW SPECIFIC ACTIVITIES TO START ON DEVELOPMENT OF ADDITIONAL ELECTRICITY GENERATING CAPACITY.
4. OBVIOUSLY, PLANNING TO PROVIDE FOR THE EXERCISE OF ALL POSSIBLE OPTIONS IS ESSENTIAL.

THE PAPERS TO BE PRESENTED LATER ON THIS PANEL SHOULD AMPLIFY IN CONSIDERABLE DETAIL, THE FOREGOING - NO DOUBT PROVIDING FOR A LIVELY QUESTION PERIOD THAT I LOOK FORWARD TO PARTICIPATING IN.

JAMES SMITH,
CHAIRMAN,
NORTHERN CANADA POWER COMMISSION.

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